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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/526,000 | 03/01/2005 | Takehisa Yamamoto | 50395-327 | 2538 |
| 20277 | 7590 | 02/22/2006 | EXAMINER | |
| MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096 | | | RIDDLE, KYLE M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3748 | |
| DATE MAILED: 02/22/2006 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/526,000

Applicant(s)

YAMAMOTO ET AL.

Examiner

Kyle M. Riddle

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03012005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Page 17, line 1, "by, mixing," should read --by mixing--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 7, 10, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui (JP 08-226419) in view of Taniguchi (U.S. Patent 5,236,274).

Matsui discloses a valve gear sliding member comprising:

- a first part or lever 22 of a rocker arm 20 that moves in linkage with a second part or rocker arms 11, 12, and having a wear-resistant member or rotor-shaped antifriction material 140 in between the contacting portion of the two parts (paragraph 16 of enclosed English translation; Drawings 1 and 2);

- wherein the antifriction material 140 is inserted in a recess or crevice 141 in the rocker arms 11, 12 and prevented from falling out by protrusion 142 acting as a stopper (paragraph 17; Drawing 4);

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- the recess or crevice 141 being larger in diameter than the antifriction material 140 which is loosely fitted therein allowing for sliding horizontally or in the parallel direction to a bottom surface of the crevice 141 and free to rotate (paragraphs 18-19, Drawing 4);

- wherein a bottom surface of the antifriction material 140 makes contact with the bottom surface of the crevice 141 and the lever 22 of rocker arm 20 makes contact with the top surface of the antifriction material 140 allowing the first and second parts to move (paragraphs 16-20; Drawings 1, 2, and 4);

- wherein a chamfer or diameter reduction part 140a is formed at a perimeter of a top surface of the antifriction material 140 (paragraph 16; Drawings 2 and 4);

- wherein the antifriction material 140 is made of silicon nitride ceramics (paragraph 21).

Matsui fails to disclose chamfers on the bottom of the antifriction material or a specific clearance between the antifriction material and the crevice wall.

Matsui does disclose the clearance s being loose-fitting (paragraphs 19-20), and Taniguchi teaches a wear-resistant chip 3a for valve actuation fitted into a recess 2a formed with chamfers at the top and bottom surfaces of the wear-resistant chip 3a (column 3, lines 9-26), wherein the chamfer at the perimeter of the bottom surface is larger than a flat fillet of recess 2a (Figures 1 and 3), and a clearance or annular space S of 0.25 mm (column 3, lines 21-25). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Taniguchi in the valve gear sliding member of Matsui, since the use thereof would have provided a means to ensure the bottom portion of the antifriction material would be prevented from abrading and sticking to the corresponding walls of the crevice or recess with the proper clearance to ensure long-lasting wear.

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4. Claims 1-3, 7, 10, 13, and 16 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 6,237,553) in view of Taniguchi (U.S. Patent 5,236,274).

Suzuki discloses a valve arrangement comprising:

- a first part or rocker arm 5 with a drive end 8 moving in linkage with a second part or valve bridge 10 (column 3, lines 1-5);
- a wear-resistant member or cap 9 rotatably received in recess 31 provided in valve bridge 10 with the lower surface of the cap 9 contacting the top surface of the recess 31 of valve bridge 10 (column 3, lines 45-55; Figures 1 and 3).

Suzuki fails to disclose specifically horizontal movement of the cap, protection from falling out, chamfered edges, a specific clearance, and the composition of the cap being silicon nitride ceramics.

Taniguchi teaches a wear-resistant chip 3a for valve actuation fitted into a recess 2a formed with chamfers at the top and bottom surfaces of the wear-resistant chip 3a (column 3, lines 9-26), wherein the chamfer at the perimeter of the bottom surface is larger than a flat fillet of recess 2a (Figures 1 and 3), a stopper 4a preventing the wear-resistant chip 3a from falling out, the stopper 4a being resilient allowing for horizontal movement in space S (column 3, lines 39-53), a clearance or annular space S of 0.25 mm (column 3, lines 21-25), and the wear-resistant chip 3a being ceramic made of silicon nitride (column 3, lines 9-11). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Taniguchi in the valve arrangement of Suzuki, since the use thereof would have provided a means to ensure the bottom portion of the antifriction material would be prevented from abrading and sticking to the corresponding walls of the recess, the wear-resistant

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cap would be prevented from falling out of the recess, the horizontal movement with the proper clearance helping to prevent wear and abrasion of the upper surface of the cap, and the specific composition of the cap to also prevent wear and abrasion.

5. Claims 4-6, 8, 9, 11, 12, 14, 15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Taniguchi, as applied to claim 1 above, and further in view of Nishioka et al. (U.S. Patent 6,237,441).

Re claims 4, 5, 8, 11, 14, and 17, Matsui, as modified by Taniguchi, discloses the invention cited above, however, fails to disclose specific flatness for the recess and wear-resistant member and a convex shape.

Nishioka et al. teach a wear-resistant member or shim with a convex shape having a surface with a flatness between 0.05-20 μm to include 0.5-5 μm and 2-3 μm (column 4, lines 52-55, lines 66-67 with column 5, lines 1-3, column 9, lines 35-37; Table 8; Figure 4). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Nishioka et al. in the valve gear mechanism of Matsui, as modified by Taniguchi, since the use thereof would have provided specific shape and flatness characteristics to prevent wear and abrasion of the sliding members of the valve device.

Re claims 6, 9, 12, 15, and 18, Matsui, as modified by Taniguchi, discloses the invention cited above, however, fails to disclose a surface roughness of 0.2 μm or less.

Nishioka et al. teach a sliding shim having a surface roughness of 0.2 μm or less (Tables 1-4, 6). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Nishioka et al. in the valve gear mechanism of Matsui, as modified by Taniguchi, since the use thereof would have provided specific

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roughness characteristics to prevent wear and abrasion of the sliding members of the valve device.

Conclusion

6. The IDS (PTO-1449) filed on 1 March 2005 has been considered. An initialized copy is attached hereto.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of 6 patents.

- Maki et al. (U.S. Patent 4,761,344) disclose a rocker arm tip with various hardness and roughness ranges.

- Matsunuma et al. (U.S. Patent 5,372,099) disclose a ceramic adjusting shim with a surface roughness of 0.05-0.2 μm .

- Bentz et al. (U.S. Patent 5,410,995) disclose a valve crosshead with a wear-reducing contact pad.

- Onoda et al. (U.S. Patent 6,315,840) disclose a sliding member of silicon nitride with specific roughness ranges.

- Nishioka et al. (U.S. Patent 6,367,439) disclose a shim for contacting a cam with specific flatness and surface roughness characteristics.

- Ishihara (U.S. Patent 6,681,735) discloses a sliding member in contact with a cam formed of silicon nitride with specific surface characteristics.


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Communication


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle M. Riddle whose telephone number is (571) 272-4864. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kyle M. Riddle
Examiner
Art Unit 3748

kmr


THOMAS DENION
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